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10/663,620	09/16/2003	Syamal K. Ghosh	86897RLO	3531

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Thomas H. Close
Patent Legal Staff
Eastman Kodak Company
343 State Street
Rochester, NY 14650-2201

EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT PAPER NUMBER

1732

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 10/663,620	Applicant(s) GHOSH ET AL.
Examiner Jeff Wollschlager	Art Unit 1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 July 2006.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-7 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-7 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Response to Amendment

The amendment to the claims filed July 25, 2006 has been entered. Claim 1 is currently amended. Claims 1-7 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 1 it is unclear whether heating in step d) is applied directly to the powdered "organic materials" or whether the heating is applied to the "homogenous slurry mixture of organic materials". For the purposes of examination, the heating is understood to be applied to the "homogenous slurry mixture of organic materials". Appropriate clarification in the claim language is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (U.S. Patent Application Publication 2003/0008071; published January 9, 2003) in view of Okuyama et al. (U.S. Patent 6,835,681; issued December 28, 2004; filed December 19, 2001) and further in view of Valint Jr. et al. (U.S. Patent 6,902,812; priority date May 5, 2003).

Regarding claim 1, Van Slyke et al. teach a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate for use in an organic light-emitting device comprising a) combining organic materials, such materials including at least one dopant component and one host component (paragraph [0112-0113]). Van Slyke et al. additionally teach g) combining the homogeneous mixture of organic powder to form a pellet suitable for thermal physical vaporization to produce an organic layer on a substrate for use in an organic light-emitting device (claim 32). Van

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Slyke et al. teach a generic mixing method, but leave the specifics of the mixing method to the ordinarily skilled artisan to determine.

Okuyama et al. teach an analogous method of mixing powders by b) providing a liquid to emulsify the materials, c) mixing the emulsified materials (col. 4, lines 19-25 and 30-33), d) heating the slurry mixture of materials in a container until the liquid is evaporated and a solidified homogeneous mixture of materials remains (col. 4 lines 35-39), e) removing the solidified homogeneous mixture of materials from the container and f) pulverizing the solidified mixture of materials into a homogeneous mixture of powder (col. 4 lines 44-45).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to combine the generic mixing method of Van Slyke et al. for mixing a powder mixture of organic materials containing at least one host material and one dopant material prior to forming a pellet from the homogeneous mixture for thermal physical vapor deposition with the prescribed detailed method of mixing powders taught by Okuyama et al., for the purpose, as taught by Okuyama et al., of mixing powders in a relatively uncomplicated manner (col. 4, lines 30-34). Further, one having ordinary skill would have been motivated to find specific mixing teachings to supplement the generic mixing taught by Van Slyke et al.

The combined teaching of Van Slyke et al. and Okuyama et al. do not teach heating the materials in a vacuum maintained specifically between $10^{-1} - 10^{-3}$ Torr. However, Valint, Jr. et al. teach a basic procedure for removing liquid from a material via evaporation. Valint, Jr. et al. teach heating the mixture while conducting the

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evaporation of the liquid under ambient pressure or vacuum (col. 17 line 64). Valint, Jr. et al. also teach that the time, temperature, and pressure conditions for evaporating liquid will depend on such factors as the volatility of the liquid and the specific components involved (col. 17 line 67 - col. 18 line 4). As such, the evaporation pressure is a result effective variable in liquid evaporation and would have been readily optimized as is routinely practiced in the art, for example, for the purpose of reducing the amount of time and thermal energy required to evaporate a liquid. Thus, the claimed invention is rendered *prima facie* obvious over the combined teachings of the prior art.

Claim 2 is directed toward the amount of dopant component in the mixture formed by the method of claim 1. The claimed range is 0.1 – 20% by weight. Van Slyke et al. teach that any range of dopant material may be selected (Claim 32, step b)). This is read to be from 0 – 100%. As such, the claimed range and the range of the prior art overlap. Additionally, as taught by Van Slyke et al. the amount of dopant added is dependent on various factors (paragraph [0112]) and would be subject to routine experimentation and readily optimized as a result effective variable.

Regarding claim 3, Van Slyke et al. teach forming a pellet by applying sufficient pressure to the mixture, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0011]) and the fact that the material is difficult to heat due to low particle-to-particle contact area (paragraph [0012]) and that these facts may have a negative impact on the ability of outgassing the

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material due to an inability to uniformly heat the material (paragraphs [0012 – 0013]).

These variables are a function of the pressure under which the powder is converted into a pellet. As such, pressure is a result effective control variable that would have been readily optimized as is routinely practiced in the art.

Regarding claims 4 and 5, Okuyama et al. further teach the use of a metal platinum container for high temperature use (col. 6, lines 2-9). One of ordinary skill in the art would have been motivated at the time of the claimed invention to employ the high temperature platinum metal taught by Okuyama due to it being a noble metal with a high melting point.

Regarding claim 6, Okuyama et al. teach mixing with a ball mill (col 4. lines 23-25).

Claims 1- 3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Slyke et al. (U.S. Patent Application Publication 2003/0008071; published January 9, 2003) in view of Jamil et al. (U.S. Patent 6,440,587; issued August 27, 2002) and further in view of Valint Jr. et al. (U.S. Patent 6,902,812; priority date May 5, 2003).

Regarding claim 1, Van Slyke et al. teach a method for forming a homogeneous mixture of powders of organic material including at least one dopant component and one host component to provide a homogeneous mixture for forming a pellet for thermal physical vapor deposition producing an organic layer on a substrate for use in an organic light-emitting device comprising a) combining organic materials, such materials

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including at least one dopant component and one host component (paragraph [0112-0113]). Van Slyke et al. additionally teach g) combining the homogeneous mixture of organic powder to form a pellet suitable for thermal physical vaporization to produce an organic layer on a substrate for use in an organic light-emitting device (claim 32). Van Slyke et al. teach a generic mixing method, but leave the specifics of the mixing method to the ordinarily skilled artisan to determine.

However, Jamil et al. teach an analogous method for mixing phosphor powders for producing a high resolution phosphor screen on a substrate for use in a light emitting device comprising: b) providing a liquid to emulsify the powder (col. 11, lines 22-32, it is noted that Jamil employs the same preferred solvent, isopropyl alcohol, as applicant), c) mixing the emulsified material to form a homogeneous mixture of material (col. 11, lines 32-42), d) heating the material in a container until the liquid is evaporated and a solidified homogeneous mixture of material remains (col. 11, lines 62-67), e) implicitly removing the mixture from the container and f) pulverizing the mixture into a homogeneous mixture of powder (col. 11, lines 59-61; col. 12, lines 1-20).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the method of Van Slyke et al. to mix a powder mixture of organic materials containing at least one host material and one dopant material prior to forming a pellet from the homogeneous mixture for thermal physical vapor deposition with the specific method of mixing powder taught by Jamil et al. because Van Slyke et al. disclose a generic method of mixing and one of ordinary skill would have been motivated to find details to fill in the gaps. The method

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taught by Jamil would have been an obvious choice because it employs powders in an analogous process to form a light-emitting device that mixes powders in a readily understandable process. Thus, the claimed invention as a whole was *prima facie* obvious over the combined teachings of the prior art.

The combined teaching of Van Slyke et al. and Jamil et al. do not teach heating the materials in a vacuum maintained specifically between $10^{-1} - 10^{-3}$ Torr. However, Valint, Jr. et al. teach a basic procedure for removing liquid from a material via evaporation. Valint, Jr. et al. teach heating the mixture while conducting the evaporation of the liquid under ambient pressure or vacuum (col. 17 line 64). Valint, Jr. et al. also teach that the time, temperature, and pressure conditions for evaporating liquid will depend on such factors as the volatility of the liquid and the specific components involved (col. 17 line 67 - col. 18 line 4). As such, the evaporation pressure is a result effective variable in liquid evaporation and would have been readily optimized as is routinely practiced in the art, for example, for the purpose of reducing the amount of time and thermal energy required to evaporate a liquid. Thus, the claimed invention is rendered *prima facie* obvious over the combined teachings of the prior art.

Claim 2 is directed toward the amount of dopant component in the mixture formed by the method of claim 1. The claimed range is 0.1 – 20% by weight. Van Slyke et al. teach that any range of dopant material may be selected (Claim 32, step b)). This is read to be from 0 – 100%. As such, the claimed range and the range of the prior art overlap. Additionally, as taught by Van Slyke et al., the amount of dopant added is

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dependent on various factors (paragraph [0112]) and would be subject to routine experimentation and readily optimized as a result effective variable.

Regarding claim 3, Van Slyke et al. teach forming a pellet by applying sufficient pressure to the mixture, but do not teach compacting the mixture in a range of pressures between 3,000 – 20,000 pounds per square inch. However, Van Slyke et al. do teach that powders have problems in their utilization in thermal physical vapor deposition due to having a relatively low density (paragraph [0011]) and due to the fact that the material is difficult to heat due to low particle-to particle contact area (paragraph [0012]) and that these facts may have a negative impact on the ability of outgassing the material due to an inability to uniformly heat the material (paragraphs [0012 – 0013]). These variables are a function of the pressure under which the powder is converted into a pellet. As such, pressure is a result effective control variable that would be readily optimized as is routinely practiced in the art.

As to claim 6, Jamil et al. teach mixing the suspension with an ultrasonic probe/horn (col. 16, lines 35-37). One of ordinary skill would have been motivated to use the ultrasonic probe/horn as taught by Jamil et al. for the purpose of minimizing mechanical contact with the mixture in order to reduce contamination (col. 11, lines 35-38).

As to claim 7, Jamil et al. do not teach the frequency at which the ultrasonic probe/horn is to be operated. However, the degree of mixing is impacted by speed of the mixing device. If mixing were incomplete, the homogeneous mixture, as required by Van Slyke et al. would not be formed. As such, mixing speed is a result effective

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variable that would have been readily optimized as is routinely practiced in the art. Additionally, ultrasonic mixing probes/horns that operate in the claimed range are routinely used and readily available commercially.

Response to Arguments

Applicant's arguments filed July 25, 2006 have been fully considered but they are not fully persuasive.

Applicant's arguments appear to be on the following grounds:

1. Okuyama et al. and Jamil et al. are nonanalogous art.
2. The combination of Van Slyke et al. and Okuyama et al. can only be accomplished with hindsight.

Applicant's arguments are not persuasive for the following reasons

1. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the problem being solved is effective mixing of powders. As such, when Van Slyke et al. teach a generic method of mixing organic powder one having ordinary skill would have been motivated to find a suitably detailed method of mixing. The method of Okuyama et al. is an uncomplicated method of mixing powders and as such would provide motivation to one of ordinary skill to adopt the uncomplicated

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method. Further, the method of Jamil et al. not only is reasonably pertinent to the particular problem, it employs a powder mixing method that is reasonably understandable to form a light-emitting device

2. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

All claims are rejected.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shi (EP 1 156 536) discloses analogous and pertinent methods for forming homogeneous mixtures of powders of organic material.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager
Examiner
Art Unit 1732

September 19, 2006


CHRISTINA JOHNSON
PRIMARY EXAMINER
9/26/06